External and Through Trips

Traffic counts were taken at all major roads at the entrance of the planning area. The 1991 external-internal trips were distributed to internal zones by use of the gravity model program using trip productions at the stations, which are actual ground counts; attraction factors resulting from the multiple regression analysis; development trends; and the Fratar Trip balancing program. The total external-internal were trip productions at the external stations. This analysis estimated that there were 20,761 external-internal trips and 18,304 through trip crossings for and average weekday in 1991. The internal zones attracted these trips based on the regression equations.

Trip Distribution

The gravity model was used to distribute the internal trips (HBW, OHB, & NHB) and the E-I travel while the through travel was assigned directly to the road network on a minimum path basis. The friction factors by trip purpose as required by the gravity model were from the 1991 Hendersonville Study. (North Carolina has gained experience, since the Sixties, in travel modelling that with confidence travel parameters from similar urban area data bases can be borrowed and calibrated to a new urban area.) The friction factors are given in Table B8. The synthetic method of developing travel patterns was checked by comparing the assignment of the travel on the existing highway system to actual ground counts at established locations. The results of the accuracy checks (mentioned earlier as screenline checks) were felt to be within acceptable limits for the purpose of this study.

Future Travel

After travel forecast models have been calibrated so that they adequately duplicate travel, design year travel estimates are produced through the input of design year data on population and employment. The trip distribution models are sensitive to changes in the road network and variation will occur in the travel patterns as alternative road networks are tested.

The future year 2020 travel was developed using the same techniques employed in modelling the 1991 travel. The Planning Director and NCDOT working in cooperation with local interests developed the probable growth factors. The Planning Director projected the necessary housing and employment data. (See Table B2 and B4). The generation rates were developed using an equation that takes into consideration vehicle ownership trends, persons per household trends, and a vehicle usage factor. (See Table B1). The generation rates for commercially owned vehicles and taxis were held constant at 6.7 and 40 trips per vehicle, respectively. The commercially owned vehicles and taxis were estimated on a zonal basis using employment growth. The attraction factors were developed and calibrated using 1991 data and 2020 housing and employment data. The secondary NHB trips were developed using the 1991 ratio of secondary NHB trips per external-internal crossings by vehicles garaged outside the planning area times the estimated